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Die Erfindung betrifft ein mehrkanaliges Gerät zur Elektrostimulation nach der Gattung des Hauptanspruchs.

For the attraction current therapy electrical devices become used, which supply over with the patient to interconnecting electrodes current pulses. Dabei werden in letzter Zeit immer mehr solche Geräte verwendet, die mehrere Kanäle, d. h. several patient electric circuits exhibit, since simultaneous should be supplyable type different at different locations the patient pulses. There is more-canal apparatuses known, with those a power supply several the corresponding number of channels and/or. Patient electric circuits intended pulse generators with corresponding output stage amplifiers supplied. To the galvanic separation a transmitter with the respective output stage is connected for each patient electric circuit, whereby the monitoring and the control the signal lining up at the electrodes becomes returned, whereby are likewise necessary for uncoupling the feedback signal transmitters. In a such apparatus the Schaltungsaufwand very high is cost-intensive and therefore because of the necessary decouplings and returns for control and rule purposes.

The invention is the basis the object to create a more-canal apparatus to the Elektrostimulation its Schaltungsaufwand compared with the apparatuses to the state of the art is smaller and is thus more inexpensive.

This object becomes according to invention by the characterizing features of the principal claim in connection with the features of the preamble dissolved. Because only a signal generator is provided, that successively inserted into each other the different pulses for the patient electric circuits supplies and that otherwise high impedance switches driven of a control unit connect those through the respective circles of associated pulses dependent of control signals with low impedance, the Schaltungsaufwand becomes very many smaller, since only a small supply transformer with a smaller power supply and only an output stage are necessary. Since the respective patient stream becomes direct controlled of the output stage, a return is necessary no longer for control or rule purposes, so that the transmitters saved to become to be able.

By the measures indicated in the Unteransprüchen favourable developments and improvements are possible.

An embodiment of the invention is in the drawing shown and becomes in the subsequent description more near explained.
Show

Fig. 1 one would circuit-in accordance with-eat embodiment of the apparatus according to invention, and

Fig. 2 an impulse signal diagram at different outputs of the apparatus.

In Fig. 1 is with 1 the supply transformer and with 2 the power supply referred, both the pulse generator 3 and the output stage 4 supplied. The pulse generator 3 is connected with the output stage, whereby the generator 3 exhibits a trigger exit 5 and a signal output 6. In the embodiment four patient electric circuits are 7 provided, are connected at which the corresponding electrodes. In both poles of the patient electric circuits 7 trichloroethylene doing similar to switches is 8, 9 connected as high impedance switches. The trichloroethylene act analog switches 8, 9 are in each case 4 connected with the output of the output stage.

The trigger exit 10 of the output stage 4 is to a counter 11 connected, which serves as divider and by four divides the corresponding number of the patient electric circuits 7. The four outputs of the counter 11 are in each case 7 connected with the control inputs of the trichloroethylene act analog switches 8, 9 in both poles of a patient electric circuit.

The impact of the circuit after Fig. 1 is with the help of the impulse signal diagram after Fig. 2 explained become.

At the output of the generator 3 and/or. because of the output to the output stage 4 is in the Fig. 2 represented highest signal as pulse group on, whereby the pulse shape of four successive pulses can be different regarding length and amplitude in each case. The signals, which the four patient electric circuits 7 obtained are, become shown in the four lower signal forms, whereby it is to be recognized that these signals inserted into each other in the output of the generator 3 and/or. the output stage 4 present are. Because of the trigger exits the trigger signal of the second line from Fig is 5, 10 of the generator 3 and the output stage 4. 2 on, D. h. it becomes with each pulse at the signal output 6 a short trigger pulse delivered. This trigger signal becomes the counter 11 supplied and in such a manner processed that four successive signals corresponding in each case in Fig. 2 signals shown at the outputs A1 to A4 of the counter 11 lie. These outputs head for successively the trichloroethylene act analog switches 8, 9 of each patient electric circuit 7, so that the switches connect 8, 9 through, so that the first pulse the first electric circuit 7, which second pulse the second electric circuit 7, which becomes third pulse the third electric circuit 7 and the fourth pulse the fourth electric circuit 7 associated. To the quasi galvanic decoupling switches are 8, 9 provided, D in both poles. h. the respective zero points the counter electrodes with switched become.

The trichloroethylene act analog switches 8, 9 can be as particular Gegentakt output stages formed.